



Seahorse XF^e Extracellular Flux Analyzers

THE WORLD'S MOST ADVANCED METABOLIC ANALYZERS

Seahorse Bioscience

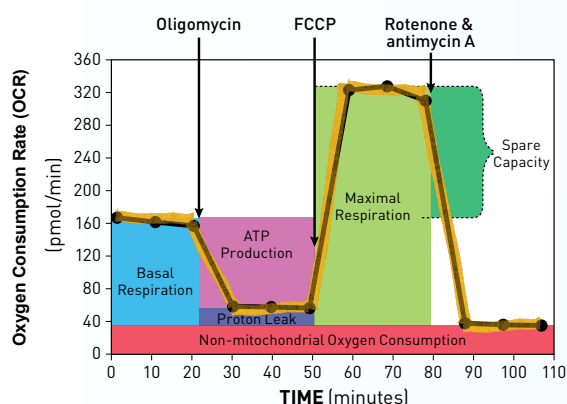
A part of **Agilent Technologies**

SEAHORSE XF ASSAYS — THE GOLD STANDARD FOR METABOLIC MEASUREMENTS

The role of metabolism in cellular and physiological processes, from cardiovascular function to immune response, is well established; many diseases are now linked to metabolic dysfunction or reprogramming. Using the Seahorse XFe Extracellular Flux Analyzer, scientists are now able to easily obtain powerful functional metabolic data to gain a greater understanding of cell metabolism and enable new advancements in life science research.

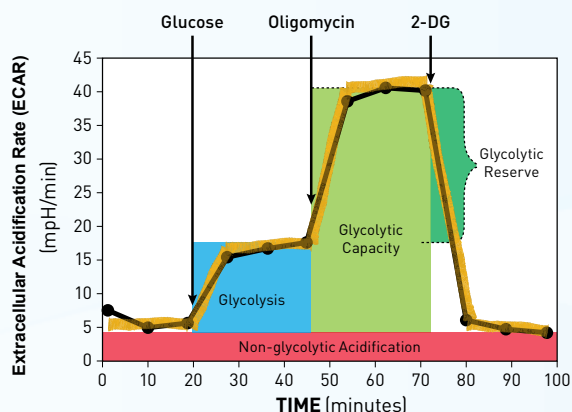
Functional Metabolic Data on Live Cells in Real Time

Seahorse XF Cell Mito Stress Test Mitochondrial Respiration



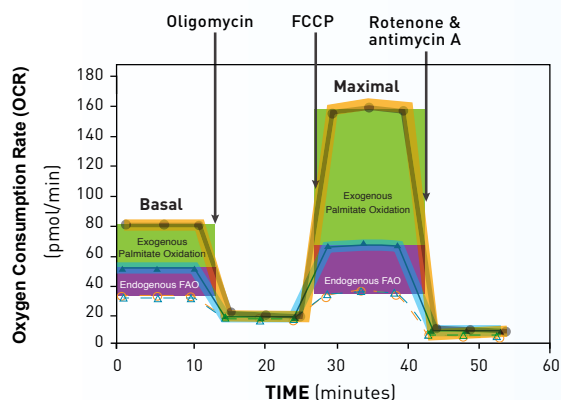
The Seahorse XF Cell Mito Stress Test measures the key parameters of mitochondrial function: basal respiration, ATP production, proton leak, maximal respiration, and spare respiratory capacity.

Seahorse XF Glycolysis Stress Test Glycolytic Function



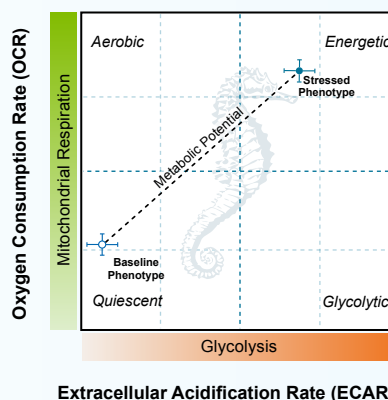
The Seahorse XF Glycolysis Stress Test reports three key parameters of glycolytic function: glycolysis, glycolytic capacity, and glycolytic reserve.

Seahorse XF Fatty Acid Oxidation Assay Exogenous & Endogenous Fatty Acid Oxidation



The Seahorse XF Fatty Acid Oxidation assay measures both exogenous palmitate oxidation and endogenous fatty acid oxidation.

Seahorse XF Cell Energy Phenotype Test Metabolic Phenotype & Potential



The Seahorse XF Cell Energy Phenotype Test measures the key parameters used to determine the energy phenotype of a cell: baseline phenotype, stressed phenotype, and metabolic potential.

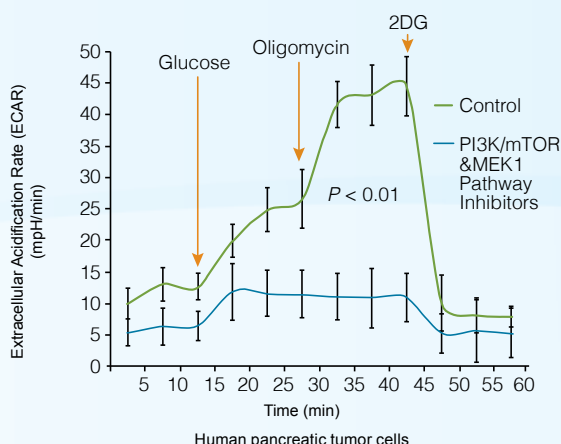
SEAHORSE XF TECHNOLOGY — GENERATING NEW INSIGHTS INTO DISEASE

Functional metabolic data is required to tell a complete story of cellular processes and pathologies.

The Seahorse XF^e Extracellular Flux Analyzer provides the capability to examine the intact and functional cellular system, enabling comprehensive investigations into metabolic pathways, substrate preference and utilization, catabolic and anabolic processes, and metabolic phenotypes.

Cancer

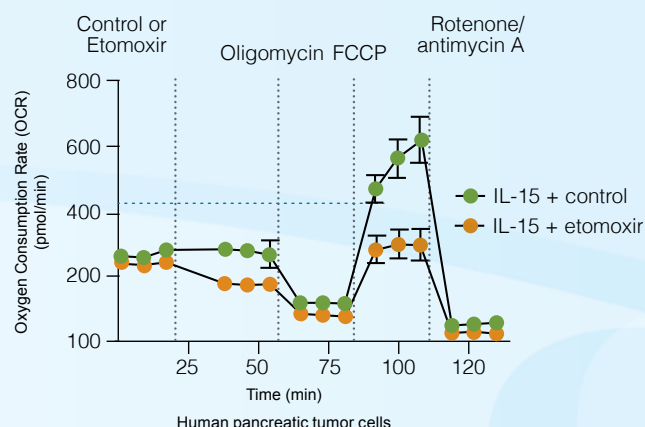
Seahorse XF Glycolysis Stress Test reveals mechanism of action of cancer pathway inhibition.



Viale *et al.*, (2014) Oncogene ablation-resistant pancreatic cancer cells depend on mitochondrial function. *Nature*. 514(7524):628-32.

Immunology

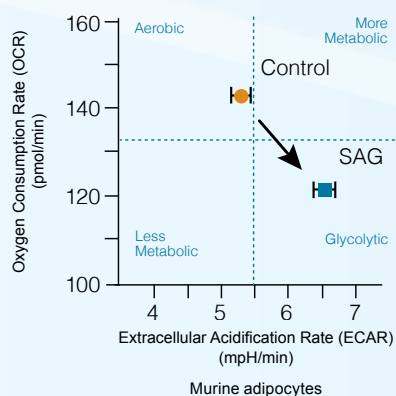
Seahorse XF Cell Mito Stress Test demonstrates fatty acid oxidation is required for memory T cell formation.



Van der Windt *et al.*, (2012) Mitochondrial respiratory capacity is a critical regulator of CD8+ T cell Memory Development. *Immunity*. 36(1): 68-78.

Obesity/Diabetes

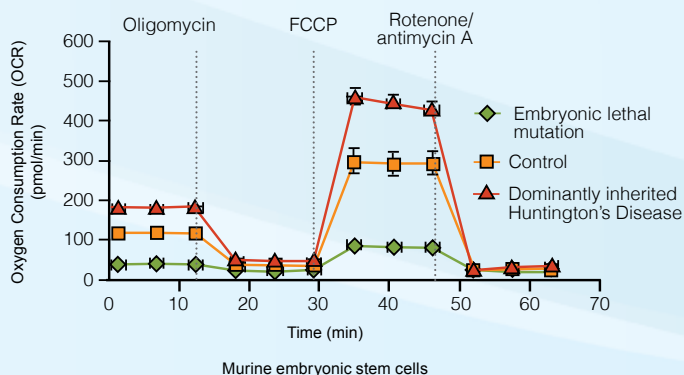
Seahorse XF technology reveals Hedgehog pathway-induced switch to a glycolytic phenotype in adipocytes.



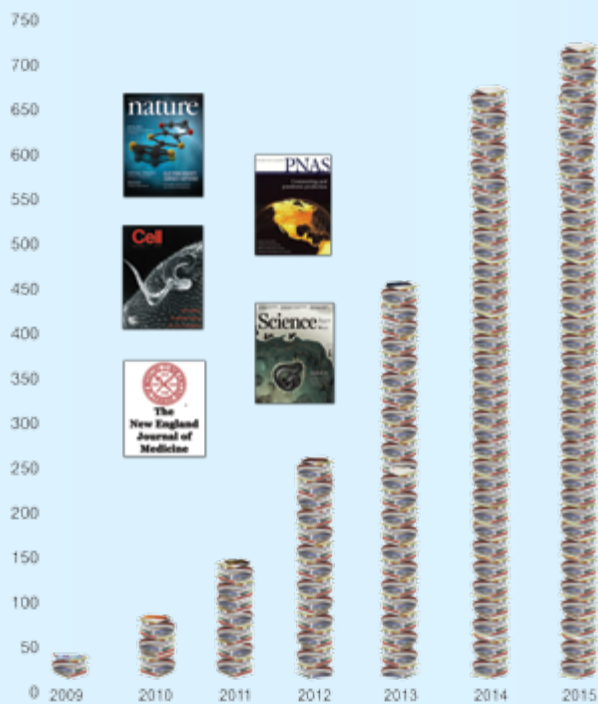
Teperino *et al.*, (2012) Hedgehog partial agonism drives Warburg-like metabolism in muscle and brown fat. *Cell*. 151(2): 414-26.

Neurodegeneration

Seahorse XF Cell Mito Stress Test reveals metabolic signatures of embryonic stem cells with Huntington mutations.



Ismailoglu *et al.*, (2014). Huntingtin protein is essential for mitochondrial metabolism, bioenergetics and structure in murine embryonic stem cells. *Dev. Biol.* 391(2): 230-40.



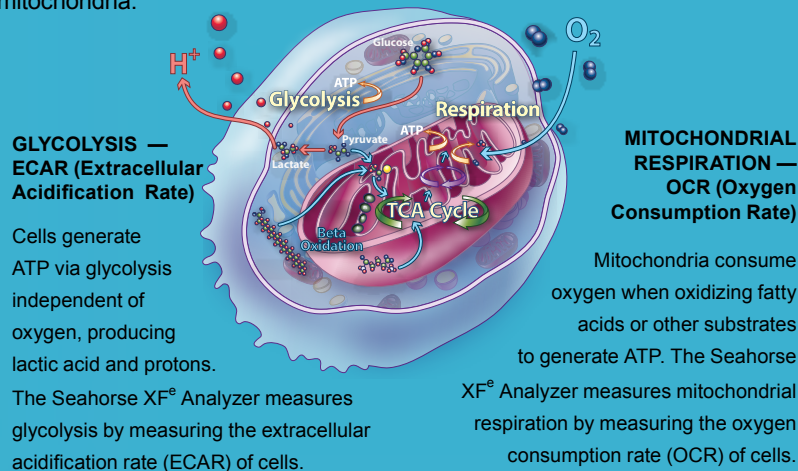
Seahorse XF Data in Publications

There are over 2,000 papers utilizing Seahorse XF technology published in leading scientific journals such as Nature, Cell, Science and PNAS. Scientists are embracing Seahorse XF technology to identify metabolic phenotypes and reprogramming, as well as target metabolic changes for therapeutic purposes.



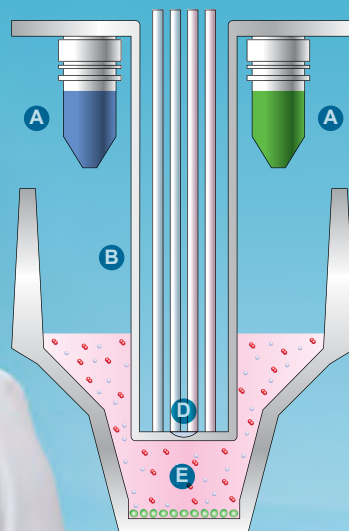
How XF Technology Works

The Seahorse XF[®] Analyzer simultaneously measures the two major energy pathways of the cell — mitochondrial respiration and glycolysis — in live cells using a label-free, solid-state sensor cartridges in a microplate format. The Seahorse XF[®] Analyzer works with all cell types, including primary cells, cell lines, suspension cells, as well as islets, *C. elegans*, yeast, and isolated mitochondria.



THE PATENTED MICROCHAMBER MAKES IT ALL POSSIBLE

The Seahorse XF[®] Analyzer utilizes patented transient microchambers which enable sensitive, precise, and nondestructive metabolic measurements in real time.



Cutaway graphic of a single probe and well

- A** Integrated injection ports sequentially deliver up to 4 compounds allowing dose response, agonist or antagonist response, or pathway perturbation analysis of each sample.
- B** Sensor probes gently lower to create a transient microchamber, allowing rapid, real time measurement of changes in both oxygen and proton concentrations in the extracellular medium.
- C** Seahorse XF Cell Culture Microplates support virtually all cell types.
- D** Inert optical micro sensors measure rates of oxygen consumption and extracellular acidification simultaneously.
- E** The microplate well requires a small number of cells, 10-20 fold fewer cells compared to conventional respirometers.

COMPLETE PLATFORM FOR METABOLIC ASSAYS

Built on innovative and proven Seahorse XF technology, the Seahorse XF^e Extracellular Flux Analyzer makes it easy to perform functional metabolic measurements in live cells, in real time. A complete platform that includes hardware, software, consumables, and reagents, the Seahorse XF^e Analyzer is a powerful and flexible system that is accelerating life science research around the world.



Bringing a new perspective to CELL METABOLISM RESEARCH

Cancer
Cardiovascular Disease
Cell Physiology

Immunology
Neurodegeneration
Obesity, Diabetes, and Metabolic Disorders

Stem Cell Biology
Toxicology and Hepatobiology
Translational Medicine



Specifications	Seahorse XF [®] 24 Analyzer	Seahorse XF [®] 96 Analyzer
Dimensions	41cm x 61cm x 43cm (16" x 24" x 17")	41cm x 61cm x 43cm (16" x 24" x 17")
Weight	20 kg (45 lb)	14 kg (35 lb)
Power Requirements	100-240VAC 50/60Hz	100-240VAC 50/60Hz
Primary Measurements Made	OCR & ECAR	OCR & ECAR
Assay Format	Live cells in a specialized 24-well microplate	Live cells in a specialized 96-well microplate
Software	Wave supports assay design, instrument control, and data analysis. Can be installed on Windows [®] PC for analysis or data export to MS [®] Excel [™] or GraphPad Prism [®] .	Wave supports assay design, instrument control, and data analysis. Can be installed on Windows [®] PC for analysis or data export to MS [®] Excel [™] or GraphPad Prism [®] .
Injection Ports	4 per well, 75 µL each	4 per well, 25 µL each
Assay Running Volume	500-1000 µL/well	80-200 µL/well
Sample Requirements	10,000-1,000,000 cells/well	4,000-500,000 cells/well
Instrument Controller	Combination computer and touch-screen display with full assay design, control, and analysis capability.	Combination computer and touch-screen display with full assay design, control, and analysis capability.
Best For/Key Advantages	Islets	Maximum experimental flexibility Highest throughput Spheroids Dose-response studies



A part of **Agilent Technologies**

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